Enhancing Penn State’s Leadership in Addressing Pennsylvania’s Human Resource Needs

The Opportunity

Pennsylvania’s future depends upon creating and sustaining economic growth in a dynamic environment dominated by changing technology. The state, the nation, and the world are embroiled in a transition to a new Information Age. The current economic expansion is based on a new reality—the emergence of high-tech sectors, including information technologies, telecommunications, biotechnology, robotics, and semiconductors. In many ways, these sectors define economic direction and well-being as they infuse the service, health, agriculture, and manufacturing segments of the economy.

Pennsylvania’s economic challenge is embedded in a context of global competition. A healthy future for the Commonwealth requires that Pennsylvania-based businesses and industries be able to effectively respond to a dynamic environment. Significantly, the intensity of the competition can only be expected to increase in the years ahead.

As Pennsylvania strives to adjust to new economic realities, it must also be concerned with who benefits from the multitude of changes. The potential for two Pennsylvanias is a distinct possibility—one Pennsylvania that reflects the creation of new wealth from a vibrant, competitive, emergent economy and another Pennsylvania that is increasingly isolated and vulnerable. The Commonwealth’s and its individual citizens’ well-being will not be bright if the two Pennsylvanias become a reality.

Confronting the 21st century challenges of Pennsylvania requires new strategic and organizational responses. Importantly, the emergent businesses and industries in the economy of the 21st century share a common characteristic—they all rely on knowledge skills and hence the education and training of their workers as the primary source of their competitive advantage. This critical
understanding of the relationship between a competitive economy and a highly educated workforce is crystal clear to the federal government and Pennsylvania’s state government. Both are responding with new and sophisticated strategies that seek to stimulate solutions that address these new workforce challenges. Penn State does contribute to the solutions, but it must do more. As the Commonwealth’s land-grant institution and premier state-related University, it must provide leadership and assume responsibility for marshaling its energies to address the problems related to maintaining a knowledgeable, flexible workforce. Only in this fashion will all Pennsylvanians and their communities experience the bright future they seek and that seems possible.

As the 21st century dawns, the University must respond rapidly to the challenges presented by the economic environment with new direction and accountability. Penn State is poised to tackle this leadership role for the Commonwealth and its citizens. President Graham Spanier has noted, “We are inventing a new model of what land-grant universities must be and must do in the 21st century. This model centers on the integration of our missions, the rapid deployment of our resources, collaboration across disciplines and delivery units, and partnerships with a wide variety of public and private organizations.” This call for Penn State to embrace the challenges of its Commonwealth community and become a fully “engaged” university IS the future for higher education. Economic and workforce development represent the initial stages through which Penn State’s engagement can be further realized and through which public confidence in its role within the Commonwealth can be bolstered.

The late Ernest Boyer, president of the Carnegie Foundation for the Advancement of Teaching, described the engaged university as follows: “... the scholarship of engagement means connecting the rich resources of the university to our most pressing social, civic, and ethical problems ... ” Certainly the economic health of Pennsylvania and its citizens through the provision of appropriate education for productive work lives is a pressing problem that Penn State surely must choose to embrace.
Workforce Development Task Force Charge

The purpose of the Workforce Development Task Force, a subcommittee of the Coordinating Council for Outreach and Cooperative Extension (CCOCE), was to develop a vision and programmatic direction for Penn State’s leadership in workforce development for the Commonwealth. CCOCE’s membership includes representatives from all colleges across the University, the Faculty Senate, Graduate School, Undergraduate Education, University Libraries, Technology Transfer, Cooperative Extension, Continuing Education, Distance Education, and Public Broadcasting.

This report represents the Task Force’s responsibility to inform the University community about the critical nature of the economic and workforce development challenge, to review current Penn State efforts, and to identify opportunities to enhance these efforts. The remainder of this report addresses these issues in the following ways:

• a discussion of Penn State’s historical involvement in workforce development

• an examination of future workforce needs and their implications in terms of workforce development

• a discussion of the Pennsylvania state government’s response to the workforce development challenge

• new Penn State initiatives related to workforce development

• recommendations for programmatic, organizational, and other actions for Penn State

Penn State’s Historical Leadership Role in Workforce Development

Workforce development can assume different meanings depending on one’s perspective. Although it often is associated with
notions of skilled labor, evolving considerations are much more inclusive. Consistent with emerging perspectives on workforce development, the Task Force embraced an expansive definition of the concept as noted below:

Workforce development focuses on preparation, recruitment, retention, and performance of an organization’s human resources. Thus, its definition can include a variety of workforce education programs such as: certificate, associate, professionally oriented baccalaureate, master's and doctoral degree programs; conferences; short courses; noncredit programs and customized services that address skill updating and competency-based educational approaches; and any program that provides retraining for career development and change.

While traditional workforce development programs have focused on school-to-work initiatives, literacy programs, and technical training, this conceptualization, no longer adequate, needs to be enhanced and expanded. Colleges and universities are uniquely positioned to provide “education for life” by teaching students to learn how to learn and by enhancing creative thinking, problem solving, and communication skills. Increasingly, workforce development requires a lifelong approach to education and training.

Using this definition, Penn State has a long tradition of offering a complex array of educational offerings across the spectrum of workforce development. Penn State provides the widest scope of programs and the most extensive delivery capacity in the Commonwealth from pre-workforce education to professional preparation. Illustrative of the scope of offerings are the examples provided below.

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<thead>
<tr>
<th>Educational Offerings</th>
<th>Penn State Involvement</th>
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<tr>
<td>Pre-Workforce Preparation</td>
<td>15 locations</td>
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<td>Tech Prep Programs</td>
<td>15 locations</td>
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13 Associate Degrees
4 Baccalaureate Degrees

School-to-Work Initiatives (55 partnerships) 19 locations
(including Penn College)
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<tr>
<th>Educational Offerings</th>
<th>Penn State Involvement</th>
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<tr>
<td><strong>Workforce Preparation</strong></td>
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<tr>
<td>Occupationally Related Credit Certificates (Primarily in Business)</td>
<td>27 programs</td>
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<td>Occupationally Related Noncredit Certificates (Exclusively in Business)</td>
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<td>Associate Degrees (Primarily in Technical Fields) (including Penn College)</td>
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<td><strong>Professional Preparation</strong></td>
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<td>Graduate Programs (Master’s Degrees, 140; Ph.D. Degrees, 94; Other Doctoral Degrees, 19)</td>
<td>148 programs</td>
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<td><strong>Continuing Workforce Education and Professional Development</strong></td>
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<tr>
<td>Post-Baccalaureate Credit and Noncredit Certificates (Primarily in Education)</td>
<td>18 programs</td>
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<tr>
<td>Occupational/Professional Workshops/Conferences (held at multiple locations)</td>
<td>1,455 programs</td>
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<tr>
<td>Management Development Programs</td>
<td>212 programs</td>
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<tr>
<td>Administration of Justice Programs</td>
<td>10 programs</td>
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<tr>
<td>Executive Education/Agribusiness Executive Education</td>
<td>28 programs</td>
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<tr>
<td>Agricultural Short Courses/Conferences (held at University Park)</td>
<td>75 programs</td>
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</table>
County-based Cooperative Extension
Workshops/Programs 67 locations

Technology Transfer Activities
PENNTAP—Technical Assistance 800 cases
in 67 counties 525 clients

Ben Franklin Technology Center
of Central and Northern Pennsylvania 21 projects
While Penn State has demonstrated considerable involvement in workforce development programming, it is not clear whether its approach has been systematic or has been kept current to reflect up-to-date workforce demands. The distribution of associate degrees across the state at various Penn State locations might be used as an example. As Table 1 illustrates (Appendix A), three general degrees are offered at most locations (Business Administration, Agricultural Business, and Letters, Arts, and Sciences), and thirteen locations offer multiple technical degrees. However, only eleven of the twenty locations offer health-related degrees (only seven of the eleven offer more than one health-related degree), and hardly any offer service-related associate degrees or more than a single agriculture degree. This distribution of associate degrees may very well have served the state in the past, but whether it still does or will do so in the future is worthy of examination.

Penn State's distribution of certificate programs across the state also raises questions about a systematic approach to delivery of such programs and whether certificate programs are keeping pace with new workforce demands. As Table 2 illustrates (Appendix A), there is substantial coverage of the state in terms of business certificates, but the same is not true for health, service, and technical certificates. The health area has a limited number of certificates, the service area certificates are very niche oriented, and the technical certificates may need to be updated. It certainly is not clear from this distribution that Penn State is well positioned to serve the Commonwealth’s workforce needs with a comprehensive array of workforce-related certificates.

Finally, until recently, Penn State has not been in a position to offer an extensive array of baccalaureate programs through its campus locations. As Table 3 illustrates (Appendix A), with the understandable exception of Penn State Harrisburg and Penn State Erie, The Behrend College, only selected baccalaureate degrees have been offered through most campuses. The relatively recent creation of the campus colleges represents an opportunity to directly address workforce development at the local and regional levels with appropriate baccalaureate degrees.
As a Research I institution, Penn State’s contributions to workforce development have extended well beyond the classroom. To illustrate, Penn State faculty are routinely involved in helping to create new companies and jobs within Pennsylvania as a result of their research activities. President Spanier has noted that a recent study revealed that “... nearly 14,000 jobs a year can be attributed to Penn State research activities ... [and it has] helped generate more than 400 new companies in the state.” Penn State is ranked second nationally in terms of industry-sponsored research with more than $60 million in annual support, and it has a significant impact on economic and workforce development in the Commonwealth.

It is not clear, however, whether Penn State’s historical response is adequate to the new workforce development challenge. Discussion of the nature of that emerging opportunity and the need for more engagement follows.
Emerging Needs in Workforce Development

There is an increasing articulation of the need for higher education to play a more critical role in addressing the workforce development issue. As business and industry demand entry-level employees who can think critically, solve problems, communicate effectively, learn how to learn, and perform in team settings, government and business are increasingly clamoring for higher education institutions to enter into dialogue about ways that they can contribute to solutions. Data descriptive of national and state trends shed light on the concerns about the workforce of the future and its development (see References, Page 38).

National Trends

- Job growth is fastest in occupational groups that require some postsecondary education; computer specialists, computer engineers, and systems analysts are the three fastest growing occupations.

- In many occupations, such as information technology, knowledge changes on a yearly basis, lending additional credence to the new concept of knowledge half-life.

- The labor force in 1996 was 134 million, and 109 million will remain in 2006; therefore, 81 percent of the 1996 labor force will still be in the labor force in 2006. By 2006, 63 percent of our workforce will be aged 35 to 64. The American Society for Training and Development (ASTD) has estimated that 90 percent of this workforce will need training or education to maintain competency during this period.

- It is estimated that people will change careers an average of 3.5 times and have ten employers; job tenure will average 3.5 years.

- On the national level, companies spend just under 3 percent of their payroll on training, or $1,526 per employee.
• Nearly half of the adult population participates annually in continuing education activities; over half of these continuing education activities are job related.

• Continuing education ranks high in importance among employee benefits; 90 percent of employers currently offer the benefit and 97 percent plan to by 2000. Both manufacturing and service industries make serious investments in employee education assistance.

• Eighty-seven percent of companies outsource their high technology training, 55 percent outsource health care training, and 81 percent outsource construction training.

• Companies spend most on professional and technical courses.

• Two-thirds of our economy is knowledge- or service-based or service producing.

Pennsylvania Trends

Population and Labor Force

• Total population will grow by 1.9 percent—a comparatively low growth rate—boosting the Commonwealth to more than 12.25 million residents by 2005; the growth will primarily be among minority populations.

• The largest shift in population will be growth among middle-age groups as the baby boom generation moves into its 40s and 50s.

• Labor force growth will slow due to the large decline in youth population reaching working age. However, the Commonwealth’s labor force is projected to increase to 6,397,000 (6.8 percent) by 2005.

• In 1998, 45 percent of Penn State’s graduates left the Commonwealth to find employment. The largest out-migration by Penn State graduates is from the most highly technical fields
Pennsylvania workers will be an increasingly diverse group as minority groups make up a larger share of the labor force.

The average age of the labor force will increase as the baby boom generation ages. Retraining of adult learners—older workers—will become more critical to meet the demands of changing technology.

The trend of more women entering the labor force will continue in Pennsylvania through 2005, with women claiming 47 percent of the workforce, increasing demand for child care workers.

Pennsylvania’s labor force participation rate should increase to 64.8 percent in 2005, up from 63.1 percent in 1994.

**Industry**

The number of service-producing jobs (which includes services; transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and government) will grow by more than half a million between 1994 and 2005, with three-fourths of the growth occurring in the services sector.

Service producers will constitute 80 percent of total industry employment by 2005, growing by more than half a million people to more than 4.5 million.

Job declines are expected in the goods producing, mining, and manufacturing sectors.

Nineteen of Pennsylvania’s twenty leading growth industries are in the service-producing sector.

The top four growth industries through 2005—health services, business services, social services, and educational services—will account for three-fourths of Pennsylvania’s nonfarm growth.

Health services will add 127,000 new jobs from 1994 to 2005, a growth rate of 24 percent. Nursing and personal-care facilities
will add the most jobs (36,300). The largest percentage gain will be in home health care services, where 19,700 new jobs translate into almost a 50-percent gain in employment—related to our aging population.

- Business services will employ 308,000 Pennsylvania workers in 2005, a gain of 37 percent over 1994. Business services will account for about 20 percent of total growth.

- Personnel supply services will increase employment by 35,200; computer/data processing services will grow by 16,600.

- Social services will employ 211,300 Pennsylvania workers in 2005, a gain of 62.5 percent from 1994. Residential care and child day care employment will account for a large portion of the growth.

**Occupations**

- The largest occupational group in 2005 will be the professional, paraprofessional, and technical occupations with 23.3 percent of total jobs.

- Most of the occupations with the highest growth rates in Pennsylvania through 2005 are concentrated in the leading growth industries—health, business, and social services.

- The top ten growth occupations include personal and home care aides, computer engineers, systems analysts, home health aides, human services workers, teachers (pre-K and kindergarten), and computer support specialists.
**Lifelong Learning Trends**

Dillman and his colleagues (1995) in a survey of 1,124 adults concluded that getting educated once is no longer sufficient. Lifelong learning is a reality for most Americans in our knowledge-based economy. Eighty-one percent of those surveyed think that getting additional education is important for success at work. Nearly three-fourths of those surveyed expressed interest in getting postsecondary education or training in the future—over half said they will enroll in a college credit course in the next three years, and 75 percent said they will take a noncredit college course.

Importantly, adults’ behaviors are consistent with these attitudes towards work-related lifelong learning. For example, 80 percent indicated that they had participated in work-related education or training in the last three years. Dillman and his colleagues conclude, however, that higher education institutions have done little to respond to this clear, rising demand for work-related lifelong learning. Many institutions have added some traditional semester-long courses to their curricular offerings, but few have redesigned their curricula or even individual courses to better serve the working population who face severe time constraints.

Perhaps it is not surprising then that more than 50 percent of the participants in the Dillman study indicated that time constraints prevent them from participating in education and that 40 percent indicated that educational courses are not available at convenient times. Given the scope and breadth of the demand for lifelong learning, teaching conducted only in the traditional campus classroom will fail to meet the public’s demand for education tailored to serve adults. Alternative formats and delivery mechanisms must be explored.

Several implications can be derived from these trends, implications that affect the way that Penn State must think about its role in workforce development. They include the following:

- An increasingly highly educated workforce will be required.
• The workforce must be increasingly adaptable to changes in the type of jobs that are available.

• Knowledge of content may be less important than skills that enable workforce members to continually learn new content.

• Workforce participants will drop in and out of the educational context even more frequently than they do now.

• The brain drain represented by the out-migration of university graduates must be stemmed in order to support a healthy economy within the Commonwealth.

• Re-education and retraining will be ongoing necessities for most of those employed.

• An aging workforce may require alternative approaches as well as alternative avenues to access education.

• The increased need for workforce-related education will lead to new competitors entering the provider arena.

• Increases in minority populations will heighten the need for diversity training to sensitize management and employees to working in teams with colleagues from widely different backgrounds.

• Educational providers increasingly will need to examine the appropriateness of their curricula to the new work environment.

• Previous areas of educational strength may become weaknesses as the economy evolves. For example, in Pennsylvania, certain types of technical engineering programs may no longer be needed.

• Penn State needs to focus on a commitment to help retain its graduates as workers in the Commonwealth. Governor Tom Ridge’s $17.2 million initiative for scholarships in science and technology-related fields provides incentives for students to work in Pennsylvania following graduation.
Penn State is not alone in its efforts to re-think its position vis-à-vis workforce education. Certainly other higher education institutions are doing so in response to the variety of pressures discussed previously. There also are an increasing number of emerging institutions seeking to enter the knowledge transmission and dissemination arena, especially through new technical avenues. In this context, moving quickly to develop strategic responses to the changing environment is critical. Effectively engaging with Pennsylvania’s state government strategy for workforce development, the topic discussed below, is one strategic response providing Penn State with perhaps its most powerful opportunity for broad and full “engagement” with the Commonwealth’s most pressing economic issue.

**Government Workforce Development Initiatives**

Sweeping legislative changes in the structure and funding for workforce development initiatives recently have occurred throughout the federal and state governments. The Workforce Investment Act (WIA) of 1998 is the most significant piece of human resource-related federal legislation passed in forty years. It provides a framework for states to redesign workforce preparation and employment systems that meet the needs of both businesses and job seekers.

The WIA stipulates that each state must designate a workforce investment board to oversee and coordinate workforce development. Pennsylvania’s response to this requirement dovetails with Governor Ridge’s creation of the public-private partnership of Team Pennsylvania. Team PA, which brings business, government, and community and economic development leaders together, was formed to foster economic growth in the Commonwealth. Team PA’s Human Resources Investment Council (HRIC) has been designated as Pennsylvania’s Workforce Investment Board. In that capacity, it is articulating Pennsylvania’s Unified Plan for Workforce Investment for implementation in July 1999.
The HRIC identified four key features to characterize Pennsylvania’s workforce investment system. They are that the system will be:

- Regionally planned and locally directed
- Market-driven
- Customer-friendly and universally accessible
- Performance-based

These characteristics are essential drivers of the new system and require careful attention from all interested parties, including Penn State.

The local orientation of Pennsylvania’s new workforce development system is reflected in the designation of twenty-three local area workforce investment boards (WIBs) (see Appendix B). These WIBs will serve as the planning and policy-making bodies for the workforce investment system at the local level. Their purpose is to ensure that workforce development services in their local and regional area support the labor and training demands of area industries, helping the workforce acquire skills and attain jobs.

The Commonwealth’s commitment to a market-driven workforce development system is demonstrated through its plan to develop a labor market information system with the Pennsylvania Department of Labor and Industry. Data available through this system is intended to provide educational providers and job seekers with current, relevant information about opportunities. While Penn State has engaged in market research for several years, this information source should provide a powerful impetus for all educational providers to focus their attention on the marketplace.

Universally accessible information about workforce development for employees and employers is a key feature of the Commonwealth’s plan. An interactive, Internet-based operating system, CareerLink, is being developed to accomplish this. It will provide information about and access to a wide array of job training, education, and employment services. Penn State’s presence on CareerLink will be critical to inform potential learners and human resource directors about the University’s programs and services.
Interestingly, payment for services to educational institutions in this new system will be provided through “Individual Training Accounts,” allowing the customer to choose the provider using an individual voucher system. Determination of which customers receive WIA funds for these accounts will be determined by CareerLink sites. Individual Learning Account pilots are underway in Southeastern Pennsylvania and York County. Such an approach highlights the Commonwealth’s intention to allow the job seekers or “customers” to drive the system. Institutions prepared to be responsive no doubt will find the most success in this system.

**Performance-based** standards is the fourth key characteristic of the Commonwealth’s system. The focus here is on requiring educational providers to demonstrate the quality of their education through the measurement of educational outcomes as opposed to educational processes. To illustrate, the new CareerLink system will list information about eligible providers and how well each certified provider performs according to established performance criteria. Several characteristics have been identified including the number of completers, placement rate, job retention, customer satisfaction, and wage at placement. At the same time, emphasis for job seekers and hence learners will be on the acquisition of identifiable competencies. This level of attention to a performance and measurement orientation is consistent with developments occurring within other levels of education throughout the country and efforts to connect industry specific skills with academic standards.

The Commonwealth, by building a sophisticated workforce development system, aims to develop a world-class workforce that will attract new industries to Pennsylvania. The Pennsylvania Legislature’s adjustments to the business tax structure will positively improve the climate in Pennsylvania, providing a competitive advantage in keeping and bringing jobs to the Commonwealth. The key question remaining is not whether Penn State will become a more aggressive participant in the arena of workforce development, but how it can do that most effectively.
Organizational Foundations

In many ways, Penn State has the organizational elements in place to work with the Commonwealth, communities, business and industry, and other educational institutions to collaboratively create a premier economic and workforce development system. First, Penn State has an unparalleled presence at the local and regional levels through its multi-campus system and through the offices of Cooperative Extension located in all 67 counties. In addition, the University is accessible worldwide through distance education and the Penn State World Campus. This positions the institution well to take advantage of the emerging focus on critically attending to and addressing workforce needs as close as possible to the local level.

Second, partnering is a key element of the new approach to workforce development. Penn State has a long tradition of partnering. At times partnership activities have involved the University, or a single campus, or individual departments. Penn State has also formed partnerships with other educational institutions in Pennsylvania, including community colleges. The key point is that the skill sets necessary to partner are harbored within the institution.

Third, the Commonwealth’s focus on a market orientation in terms of needs assessment as well as customer satisfaction are areas of familiarity for Penn State. Institutionally, Penn State has had units dedicated to determining Pennsylvania’s educational needs since the late 1960s and more recently has oriented that function toward market assessment. These capabilities, while perhaps not fully developed in terms of deploying them for the purpose of launching a workforce development initiative, do provide a solid foundation of organizational strength from which to move forward.

Programmatic Foundations
Programmatically, Penn State’s historical involvement in building and sustaining economic and human resource development in Pennsylvania has been extensive. In recent years, however, the changing context has led to new initiatives in a number of areas that signal the potential for a significantly expanded institutional role in the area of workforce development. To illustrate, Penn State has responded to criticism of its undergraduate educational program by revising its general education requirements to explicitly include “thinking competencies” of students. The undergraduate general education mission states that “Thinking competencies—creating, designing, constructing, applying, leading, and managing—are increasingly requirements for development of more effective and competitive processes, services, and products.” In addition, Penn State offers enrolled students the opportunity to gain credit by presenting a portfolio of documented learning that may have been gained in non-collegiate settings. The portfolio is assessed by faculty from the relevant academic area who assign credit on the basis of regular course equivalencies.

Students also need broad overviews of the world to succeed in an internationally and culturally diverse environment. Some academic programs may focus on particular knowledge mastery and skill development, however, all degree programs provide experiences aimed at the development of attributes of scholarship necessary for lifelong active and collaborative learning.

Many programs include internships, field experiences, cooperative education programs, and service learning opportunities for students. A recent example is a course offered in the College of Earth and Mineral Sciences, Department of Geography, titled “Rethinking Urban Poverty.” The course involves ten Schreyer Scholars from five different colleges living in inner-city Philadelphia for five weeks in the summer and conducting research that can be given back to the community for activism and policy making. Cooperative education programs are offered through the Eberly College of Science, The Mary Jean and Frank P. Smeal College of Business Administration, the College of Engineering, and the College of the Liberal Arts. As the Kellogg Commission notes about the engaged institution, “It must enrich students’ experiences by bringing research and engagement into the curriculum and offering
practical opportunities for students to prepare for the world they will enter.”

New Penn State initiatives in nonformal workforce preparation programming continue to develop, as well. Cooperative Extension’s four-year plan of work for 1999–2003 includes a new workforce preparation programming initiative. The programs that will be developed, implemented, and evaluated focus specifically on preparing Pennsylvanians to obtain and retain employment. This new plan of work provides the resources for Cooperative Extension county educators to carry out workforce preparation educational programming within their communities. The Cooperative Extension plan of work is in response to local needs assessments that identified workforce preparation as a local and state need and to the U.S. Department of Agriculture’s National Workforce Preparation Initiative.

Beyond the adjustments and new program initiatives noted above are recent developments related to technical education areas, areas for which Pennsylvania has a high level of interest arising from its identification of “Technology 21” industry clusters—technology for the 21st century. This effort, an industry-led project commissioned by Governor Ridge, is developing a strategy to stimulate growth of high-tech companies in Pennsylvania in six broadly defined industry clusters: Advanced Materials Production, Advanced Manufacturing, Agribusiness, Biotechnology, Environmental Technology, and Information Technology. Penn State has the informal lead in Advanced Materials Production, Advanced Manufacturing, and Agribusiness. Interestingly, these clusters differ somewhat from traditional industry classifications thereby providing some insight into potential new areas of future major workforce needs around which industry, government, and education stakeholders may collaborate. Noted below are brief synopses of the economic potential of these areas and some of Penn State’s current educational responses.

Advanced Materials Production and Advanced Manufacturing

DEMAND: There is enormous potential for economic growth in this knowledge-based industry in Pennsylvania. Penn State’s
strength is in its research capability as well as in its specialized lab facilities and technology available to support this growth industry. A 1999 survey of companies involved in this field revealed that 31 percent plan to expand their workforce by an average of 10.5 percent over the next twelve months.

RELEVANT PENN STATE PROGRAMMING: The Powder Injection Molding program in the College of Engineering at Penn State is based on the college’s strong research foundation. Approximately 2,000 individuals a year take advantage of the combination of laboratory and educational activities that comprise the program. These include undergraduate and graduate students, practicing mechanical and metallurgical engineers, management staff in business and industry, and individual entrepreneurs. In addition, with the support of the Ben Franklin Technology Center, many new alloys and lubricants have been designed and are in actual production.

A second programmatic example in this area is a prototype resource-sharing educational program for the semiconductor industry. Through this Semiconductor Manufacturing Technology (SMT) program, students earn an SMT associate degree from two-year degree granting institutions across Pennsylvania by taking three semesters of course work at their home institution and a one-semester capstone hands-on experience in the Nanofabrication Facility on the University Park campus. This workforce-related program would not have been possible without Penn State’s state-of-the-art Nanofabrication Facility.

Agribusiness

DEMAND: Agribusiness is America’s largest industry. It accounts for about 16 percent of the Gross Domestic Product (GDP) and about the same percentage of employment in the United States. Farming and food processing alone employ more people than do the steel, automobile, and computer industries combined. The U.S. agribusiness industry employed nearly 2.1 million people as of 1996. In Pennsylvania, agriculture and
related businesses account for $40 billion per year in commerce and one in five jobs.

RELEVANT PENN STATE PROGRAMMING: Agricultural business management majors, both associate and baccalaureate degrees, are offered jointly by the College of Agricultural Sciences and The Smeal College of Business Administration. Penn State also offers continuing professional education in this content area as represented by the Agribusiness Executive Program. This intensive weeklong seminar provides a strategic perspective on today’s global agribusiness environment, integrating international market opportunities, operating effectiveness, and financial success. Twelve top agribusiness executives from firms in Pennsylvania, Illinois, and Peru participated in the first Penn State Agribusiness Executive Program held in 1998.

The Dickinson School of Law of The Pennsylvania State University, through its Agricultural Law Center, provides educational programs, information, and materials to those involved in or interested in the agricultural industry. Penn State Dickinson School of Law is only one of three law schools in the country to have such a center. It is a collaboration between the Dickinson School of Law, the College of Agricultural Sciences, and the Pennsylvania Department of Agriculture. The center provides the following services: cutting-edge research on current and emerging issues of interest to the international agricultural business community; information relevant to agricultural producers, the food processing industry, and government at all levels; a current index and bibliography of relevant professional articles and extension outreach materials on agricultural issues; professional-level courses focused on legal issues related to agriculture; information and assistance to the general public, agricultural and food industry groups, the Pennsylvania state legislature, legal professionals, and Pennsylvania state agencies, boards, and commissions; and the highest-quality educational information and materials to help people understand complex legal issues and problems.
Penn State Cooperative Extension’s educational programming provides agricultural producers and businesses in the 67 counties of Pennsylvania with current technical and business management information that they need to remain profitable in a rapidly changing industry. Pennsylvanians employed in the agricultural business sector participate in a broad range of programs such as pesticide management, dairy production, and enterprise management. These programs provide Pennsylvania’s agricultural industry with the cutting-edge information needed to meet state and federal regulations and market demands.

**Biotechnology**

**DEMAND:** Biotechnology is a $13 billion industry. Currently, 1,100 Pennsylvania biotechnological, pharmaceutical, and related industries employ 59,000 individuals with total annual wages of $3 billion and an average wage of $52,250. Employment within the biotechnology sector is expected to grow at approximately 15 percent annually for the next five years. *Standard & Poor’s 1998 Industry Survey* predicts that the U.S. biotech industry should see an acceleration of revenue growth over the next few years, with annual revenue growth rates in the 20 to 25 percent range for 1999 to 2000.

**PENN STATE RELEVANT PROGRAMMING:** The Eberly College of Science’s undergraduate degree in biotechnology provides future biotech employees with a thorough background in the sciences on which biotechnology is based, a comprehensive understanding of molecular biology, and a unique hands-on biotechnology lab experience. Additionally, the college’s Biotechnology Training Program provides programs for updating the skills of biotech employees. This is accomplished through a hands-on learning environment for studying fermentation methods, animal cell culture, separation and purification techniques, and recombinant DNA techniques. More than 1,200 individuals from 30 states and 12 countries have been educated through this eleven-year-old program.

**Environmental Technology**


DEMAND: The *U.S. Industry and Trade Outlook 1998* reports that the environmental technologies industry is one of the fastest growing industry sectors worldwide. The global market for environmental technologies is expected to grow from about $420 billion in 1995 to approximately $600 billion by 2010. The U.S. environmental technology industry employed about 1.3 million Americans in 1995, or 1 percent of the U.S. workforce. A recent study found that more than 42 percent of the surveyed companies plan to expand their workforce by an average of 12 percent in the next twelve months. One in eleven companies projects growth of more than 25 percent.

PENN STATE RELEVANT PROGRAMMING: Many environmental programs are offered at Penn State through the College of Agricultural Sciences, the College of Earth and Mineral Sciences, the Eberly College of Science, the College of Engineering, the College of Health and Human Development, and the College of the Liberal Arts on topics such as mining, meteorology, agricultural environment, environmental interpretation, geographic information systems, etc. For example, College of Engineering faculty offer a program on stormwater management that is based on research advances in computer simulation, hydrology, and watershed management. The direct result of the program is to upgrade the knowledge base and re-skill planners, surveyors, and engineers—those directly responsible for effective stormwater management practices—by educating these audiences with a comprehensive array of the latest hydrologic and hydraulic tools. As a consequence, those responsible for the design and management of stormwater management facilities will be more effective in reducing flooding and in preventing costly cleanup operations. This three-day short course places special emphasis on fundamental hydrologic and hydraulic calculations and the use of the Multi-Stage Routing Model for detention facility design. Participants get hands-on practice using the software to analyze and solve typical stormwater facility problems. Effective stormwater management is a key aspect of environmental protection and has a direct impact on sustainable communities and economic development.
Shaver’s Creek Environmental Center is a University-wide resource providing approximately 500 educational outreach programs to children, youth, and families and educators statewide. Course work focuses on environmental interpretation. The center serves 150,000 people a year.

Information Technology

DEMAND: Pennsylvania is an active player in the information technology arena and can claim more than 4,300 information technology companies employing more than 92,000 people. Nationwide, according to the Value Line Investment Survey of March 1999, the $154 billion computer software and services industry faces good long-term prospects. Value Line predicts the industry “will be on a fast growth track out to 2001–2003.” Similarly, the $726 billion worldwide telecommunications industry is expected to grow to $1 trillion by 2001, according to Hoover’s Online. The U.S. share of the market is estimated to be about $340 billion. The defining feature of today’s telecommunications industry is change, spurred by technological advances and deregulation. Deregulation is spreading around the globe, offering opportunities for U.S. telecommunications abroad. Likewise, new foreign players in U.S. markets will increase competition at home.

PENN STATE RELEVANT PROGRAMMING: The new School of Information Sciences and Technology (SIST) is Penn State’s newest University-wide initiative to meet corporate needs for state-of-the-art education and training in technology. The new program is being designed, with industry participation, to educate a “new breed” of information science professionals. It builds upon the strengths of current information sciences and technology-related programs across the Commonwealth. In response to corporate needs, the curriculum emphasizes the integration of information science, communication, and business and technical skills. It should include internships and cooperative work programs. Graduate programs begin in fall 2000. Penn State plans to enroll 800 undergraduate students
at University Park and 1,000 at other campuses over the next five years. The outreach programming potential is much larger.

The proposed Technical Communications Certificate program of the College of the Liberal Arts is designed to meet the continuing education needs of technical communicators. It is designed as a series of seminars with intensive training in a variety of topics, including writing for the Web, developing online help information, technical documentation, technical editing, and indexing. Technical communications is one of the fastest growing professions in the United States and internationally. Technical communicators work in a cross section of jobs, including health care, industry, entertainment, technology, and education.

This discussion of Penn State's emerging organizational and programmatic foundations in economic and workforce development reveals recent indications that the University is capable of providing new levels of contributions and leadership in this arena. That readiness factor is important as the University gives consideration to significantly enhancing its role in workforce development.

Conclusions and Implications

This report has outlined the challenges for the Commonwealth and the opportunities for the University represented by workforce and economic development, some of Penn State’s historical involvement in the field, the rapidly emerging need, federal and state governments’ interest in this area, and recent relevant Penn State activity. A number of conclusions and implications can be drawn from the information provided:

- A bright future for Pennsylvania depends upon the Commonwealth’s ability to educate and retain a highly educated workforce.
• The emerging global competition means that time is of the essence in creating the full capability to engage in workforce education.

• The workforce of the future must be highly adaptable, depending on “thinking competencies” and the ability to learn. Colleges and universities are best suited to meet these particular types of educational expectations.

• Pennsylvania’s future workforce must be prepared to engage in continuous lifetime learning that is accessible at the work site, at home, on-line, or at a nearby education site.

• Workforce development is embedded in Penn State’s historical mission as a land-grant institution and in its emerging role as an “engaged” university.

• A sense of urgency in addressing workforce development is essential on the part of Penn State for at least two reasons: (1) numerous new educational providers are entering the postsecondary educational marketplace through new technological means, and (2) the state government is fully prepared to develop a workforce development system with or without Penn State’s participation.

• Penn State’s strong linkage with business and industry through research relationships give it an advantage in responding to new initiatives in economic and workforce development, particularly in the Technology 21 clusters.

• The most fertile areas for workforce development in the future may or may not directly relate to areas of past activity. Careful analyses of the existing workforce development program portfolio as well as exploring future opportunities are essential to long-term success.

• While there is a tremendous amount of good work under way at Penn State (see Appendix C), a system of sharing information on best practices in economic and workforce development is underdeveloped. Better information, systematically and
strategically communicated, would enhance our efforts. That information would also be useful in University public relations, governmental relations, and with our stakeholders.

- Economic and workforce development has the potential to integrate teaching, research, and service activities in ways not possible with other types of initiatives. Such integration has the potential to make Penn State a more productive and effective higher education institution from the perspective of our sponsoring society.

Based on these conclusions, the value of Penn State’s participation in economic and workforce development seems clear. The form that engagement would take and the steps necessary to realize full involvement are considered in a series of recommendations. These recommendations are designed to strengthen the linkages of Penn State with the Commonwealth’s economic and workforce development initiatives. They are also intended to strengthen Penn State’s institutional response to workforce development in light of changes in the Commonwealth’s systems. And, finally, these recommendations are focused to ensure Penn State becomes and remains a certified and preferred provider of education and training for all levels of the workforce in Pennsylvania, including the adult learner in the workforce and the adult who is transitioning between jobs or careers. The recommendations are intended to fulfill the Task Force’s initial charge to provide guidance to Penn State University in vigorously pursuing this opportunity for more engagement with the Commonwealth, where the opportunity for making a difference is great.
Recommendations and Actions

Penn State Strategic Initiatives

1. Workforce and economic development needs to be identified as a University-wide, interdisciplinary strategic initiative.

   President Spanier, in consultation with the Council of Academic Deans and the University Planning Committee, should consider establishing a strategic initiative around economic and workforce development.

2. Penn State should establish a University standing committee to facilitate the University’s economic and workforce development needs analysis efforts and better coordinate our efforts as a University for greater synergy and impact. This body would serve as a champion, advocate, and clearinghouse for workforce development. Penn State should also consider identifying an office to support this committee and serve as an organizational focal point to support faculty interested in engaging in this work and implementing the many other recommendations noted in this report.

   Representatives should be drawn from those serving on the Human Resources Investment Council (HRIC) standing committees, Workforce Investment Boards, CareerLink advisory boards, and other major units heavily involved in economic and workforce development within the University, and include faculty as well as administrators from key outreach units.

   A representative should be identified to create a faculty support office in the Provost’s Office, Technology Transfer, or Outreach and Cooperative Extension to support the University standing committee and to facilitate forums and other activities.

3. Penn State should develop a University-wide workforce preparation marketing strategy that clearly and simply
articulates Penn State’s leadership role in the education of Pennsylvania’s workforce and development of the Commonwealth’s economy.

A University-wide marketing subcommittee of the University standing committee, in cooperation with University Relations, should be created to develop a strategy to create statewide awareness of Penn State’s engagement in workforce development.

4. Penn State should respond with workforce educational and training programs in biotechnology, environmental technology, information technology, advanced materials production and advanced manufacturing, and agribusiness and the top industry growth areas, including health services, business services, social services, and educational services.

Each college, as part of its strategic planning process, should be charged to undertake an in-depth portfolio analysis of programs currently offered in the high demand areas pertinent to the college and the adequacy of those programs for current and future demand. Colleges should recommend appropriate new programming.

5. Penn State should develop more associate degrees and certificate programs, including post-baccalaureate certificates that provide the technical and management skills needed to address the Commonwealth’s growing industrial workforce and economic development needs. When appropriate, these associate degrees and certificate programs should be aligned with more advanced degrees.

Penn State’s campus colleges should take the lead in developing new certificate and associate degree programs, in partnership with University Park colleges and outreach delivery units, to develop market-driven credit and noncredit programs. University Park Continuing and Distance Education, working closely with the colleges, should also develop new certificate programs to meet emerging needs. Where
appropriate, these programs should be delivered statewide or regionally.

6. Penn State should enhance internships, practicums, and service learning that provide practical opportunities for students in the workplace in concert with their academic preparation.

The College of Communications’ Academic Service Learning model, titled “A Curriculum of Consequence” (acronym SOURCE—Service, Outreach, Unity, Research, Community Education), might be considered a best practice for other colleges to explore. This should be a major topic for an Academic Forum.

7. Penn State should make information available to undergraduate students to make them aware of workforce education-related certificate programs as an additional option they might pursue to enhance their competitiveness in the job market when they graduate.

Penn State’s undergraduate advising system should be engaged to help determine the best way to ensure that students have access to workforce-related program information.

8. Penn State should continue to ensure that faculty are recognized and rewarded for their workforce and economic development outreach activities.

Penn State should support the Faculty Senate’s work on administrative guidelines specific to assessing outreach in Promotion and Tenure (P&T) reviews. This work includes consultation with college P&T committees to make them aware of the new policies. Recognition includes the annual Award for Faculty Outreach, publicizing their work through the Penn State Outreach magazine, Intercom, Research/Penn State, and other special University publications. College outreach awards and outreach components of college strategic plans should also be encouraged.
Penn State should create Outreach Fellow positions to support faculty activities.

9. Penn State should consider establishing a special incentive fund for faculty for new workforce development initiatives to encourage and facilitate their entry into this outreach arena.

A University strategic initiative should include identification of seed funds annually to support faculty and their students engaged in economic and workforce development projects benefiting the Commonwealth. These funds could be allocated by the University standing committee for faculty proposals that match University resources to the Commonwealth’s needs.

10. Penn State should actively develop partnering opportunities—especially with other higher education institutions—to expand opportunities to serve regional and local needs.

The Governor’s School for Information Technology collaboration with Drexel University, and Continuing Education’s Management Development programs offered in conjunction with the University of Pittsburgh at Johnstown and Penn State Altoona provide models for such ventures. Other models are the semiconductor pilot project and statewide School-to-Work Resource Center.

**Penn State Organizational Strategies**

11. Penn State should develop strong linkages with Team Pennsylvania (Team PA) and the Human Resource Investment Council’s (HRIC) standing committees—notably the Incumbent Worker, Information Technology, Workforce Education, Employment Statistics/Communication, and Rapid Response Committees—encourage Penn State faculty and staff involvement on the local Workforce Investment Boards (WIBs) statewide where possible, and establish a local presence for Penn State within each Team PA CareerLink Center.
Governmental Relations should communicate with the HRIC regarding broadly representative Penn State leadership participation with these standing committees; ongoing relationship development should occur between Governmental Relations and Outreach and Cooperative Extension with the HRIC representatives. Governmental Relations should also explore linkages with the Federal Workforce Investment Act initiatives for Penn State.

An annual report to the Commonwealth on Economic and Workforce Development activities of the University should also be considered.

12. Penn State should strengthen its connections between economic development and workforce development programs and services in Technology Transfer, Cooperative Extension, Continuing Education, and specialized institutes. These units play key roles in the Commonwealth’s economic development model and are interrelated.

Technology Transfer, including PENNTAP, Ben Franklin Technology Center, the Commercialization Office, and Outreach and Cooperative Extension should collaborate on development of an action plan, identifying a set of joint initiatives, to create a more comprehensive response to economic and workforce development needs of the Commonwealth.

13. Faculty expertise in economic and workforce development should be aggregated University-wide from various campuses and departments and a forum created to facilitate and support the exchange of ideas.

The University standing committee could identify faculty resources and conduct a quarterly forum on economic and workforce development in Pennsylvania. Invited speakers could facilitate discussion among these faculty on topics relevant to their research.

14. Given the new HRIC initiatives and components of the new workforce development system, such as Individual Learning
Accounts and contracts for educational services, Penn State should: (1) review its processes to ensure that its workforce-related education and training programs can become and remain certified and (2) review the policies for the WIBs vouchers to ensure that students can use them for Penn State programs so the University can remain a competitive provider.

The Vice President for Enrollment Management should convene a working group to assess policy, procedure, and processes that would be affected by the new system.

**Penn State as a Leader in Economic and Workforce Development**

15. Communication links should be established across the University and with the Commonwealth to keep abreast of current workforce development system initiatives and priorities. Existing Penn State-generated employment/labor force/demographic research reports should be linked to the Pennsylvania Workforce Development Information System to enhance understanding of trends, and this information should be shared systematically within the University.

The University standing committee should establish a Web site on which all Penn State economic and workforce development-related reports would be posted. Participating members would be offered the opportunity to develop the Web site.

The standing committee should identify a unit to establish and maintain a subscriber listserv for those internal and external to Penn State so they could access an electronic newsletter that would keep them informed of new developments. Maintenance of the listserv could be rotated among key outreach units to share responsibility.

16. To inform the public and industry of its workforce development efforts, a listing of Penn State’s offerings University-wide should be accessible across the Commonwealth on the CareerLink electronic network, because this is the one-stop shop for
employers and employees to access education and training needed to acquire necessary knowledge and skills for the workplace.

The University standing committee should explore staff resources necessary to collect the relevant workforce development information from Penn State resources to organize and distribute the information through the CareerLink electronic network. In addition, staff would be responsible for the other communication systems recommended in this section of the recommendations.

17. A plan to enhance the current systems of referral among Penn State units to maximize Penn State’s program development and delivery opportunities in the CareerLink system should be developed.

The University standing committee should create an electronic bulletin board that would be used to make Penn State units aware of these opportunities through the CareerLink system.

The standing committee should create an electronic “Opportunity Alert System” for use within Penn State. Users of this system, those developing new education and training programs and students interested in career information, could register with the system and identify key words that are relevant to their needs. They would then be alerted immediately of any new opportunities appearing in CareerLink that were appropriate. Career Services and the Center for Adult Learner Services should be involved.

Note: The two systems noted above would operate much as the bulletin board and alert system currently function for the Grants and Contracts operation.

18. A variety of external advisory boards exist for colleges, campuses, and program areas. The University standing committee should assess best practices in using external advisory boards to gain input on local needs.
President Spanier should give consideration to appointing an external advisory board, chaired by the Provost, with representation from industry chief executive officers from the Technology 21 clusters, the Pennsylvania Chamber of Business and Industry, the Pennsylvania AFL/CIO, the Pennsylvania State Education Association, the Pennsylvania School Boards Association, the Human Resource Investment Council (HRIC), the Pennsylvania Farm Bureau, the Penn State Ag Council, etc.

**Penn State’s Opportunity to Strengthen its Assessments of the Commonwealth’s Needs**

19. Penn State should collaborate with Team PA to further identify and monitor Pennsylvania’s critical job growth categories and potential and continue to develop appropriate programmatic responses where appropriate.

   Outreach and Cooperative Extension should seek to formally designate a liaison with Team PA to facilitate the flow of needs-related information.

20. Penn State should continue to enhance its ability to understand the economic and workforce development needs of the Commonwealth and develop educational programs that address marketplace changes and student interests, enhancing fit between programs and needs both University-wide and regionally.

   The evolving state labor market information system, managed by Labor and Industry’s Bureau of Research and Statistics, provides a new opportunity to participate in sharing information on regional and local needs. Penn State’s Pennsylvania State Data Center and specialty reports from the Department of Rural Sociology, Population Data Center, and other Penn State data centers, including Outreach and Cooperative Extension’s Office of Marketing Research should be involved in these efforts. New education and training program development should be based on market research and these information systems.
21. A critical element of the needs assessment process is listening to stakeholders and partners, employees, and employers. Penn State should enhance collaboration in the needs assessment processes.

The University standing committee, Outreach and Cooperative Extension, the Regional Councils for Cooperative Extension and Outreach, and Technology Transfer should jointly develop a plan to conduct a collaborative needs assessment process building upon the decennial census and the next cycle for Cooperative Extension’s Program of Work (POW).

Penn State’s Support in Development of Performance Measures

22. Penn State should develop common outcome assessments and methods for systematically capturing information related to assessments of quality and impact of workforce-related programs and services for reporting purposes within the University and to external stakeholders. Penn State could assist the Commonwealth in developing performance measures as well since this is a requirement that will be addressed in the new workforce development system.

Under the auspices of the University standing committee, an Economic and Workforce Development Consortium—a faculty committee of experts in these areas—should be given resource support to design performance assessment models for University practitioners involved in workforce development education and training.

Other Observations

23. Penn State should enhance awareness of the benefits to faculty of participating in workforce development efforts: e.g., consulting, industry-sponsored research, placement of
graduates, student internship and cooperative learning experiences, and research opportunities.

24. Penn State should work with the emerging county-based Education Councils to ensure that they are aware of Penn State programs and services.
References


Penn State General Education Mission Statement, Fall 1997.

Penn State Outreach Inventory, http://www.outreach.psu.edu/News/.


